

Foreword

The book, edited by Ettore Bolisani, has the special merit to explore the sense of what is going on in the interplay between information technology and knowledge management. The contributions focus on the role played by the Internet in knowledge development and exploitation. The answer is not trivial, as the question involves a deep reconsideration of many different issues, which are usually taken for granted: epistemological issues about the nature of knowledge, engineering issues about functionalities and reliability of technologies, and management issues about proper rules and methods to gain advantages from available technologies.

Surprisingly, after about two decades of debate on the role of knowledge and learning within and between organizations, only few things appear to be widely accepted by the community of scientists and practitioners. First, that knowledge is the principal asset of any organization. Second, that the incessant development of ICT technologies continuously reframes the issue of knowledge exploration and exploitation. Several couples of concepts have problematic relationships: objective vs. subjective knowledge, tacit vs. explicit knowledge, declarative vs. procedural knowledge, engineering view vs. sociological view of knowledge, knowledge vs. knowing, and last but not least, knowledge vs. information.

An evident cue that a research community is undergoing a cultural revolution is that taken-for-granted concepts and habits become more and more enigmatic. This is the case with knowledge. Creating and diffusing knowledge is becoming a relevant business, with global and local players. Companies producing ICTs provide organizations with different solutions, which have significant impact on organizational processes. Diversity is the major feature of an emerging market, as it was for the car market in the first decades of 1900's. Of the 2500 motor vehicles counted for 1899, 1681 were steam propelled, 1575 electric and 936 gasoline. In 1920, a single vehicle dominated the US market—Ford's Model T. The process of exploration, selection, and convergence toward a dominant design is a typical trend of any new market.

It is not easy to forecast when convergence to dominant design will happen. Many trade-offs contribute to delay the convergence process:

- Trade-off between organizational and local KM levels. Organizational complexity is not only related to company size and articulated external relationships, but also to the complexity KM different levels: individual, group, business units, functions, departments, the whole company. At each level KM issues present different and contrasting needs;
- Trade-off between standardization and diversity. Knowledge and learning are aimed to fostering internal diversity, which is one of the major sources of competitive advantage. Any technological standardization in knowledge management and learning process, while improving efficiency, is a menace to the company's ability to promote diversity;
- Trade-off between technological innovation pace and organizational exploitation of technology potentialities. The fast-pace and unpredictable directions of ICTs innovations move away from any

attempt to converge and redefine the range of possible KM solutions. Between the 1978 double loop model by Argyris and Shon and today's collective intelligence model there is an amazing flow of radical ICTs innovations, which dramatically reframed the problem setting in KM. This flow doesn't seem to decrease. Thus, it is likely that the range of possible solutions will widen in the near future.

We are expected to face a high-grade of uncertainty in KM until a dominant design will emerge. Nevertheless, reading this book will help the reader to define main topics that will shape the research agenda of following years. In particular, I would like to focus on three major issues.

Knowledge codification. The simplest approach to knowing is the classical scheme of knowledge transfer. A knowledge object is passed by a knowledge source to a receiver, who makes some use of it. But this is a very naïve view. A more sophisticated view distinguishes among three concepts organized into a hierarchy: data, information and knowledge. Data are collections of raw measures of some event. Information comes as an elementary structure built on data, and knowledge is a more complex structure built on information, in order to link what is coming from the experience to existing knowledge and plans. At a first glance, this seems a very useful conceptualization. By using those three concepts we can easily recognize the number "8" as data, the message "It is eight o'clock" as information, and "I'm late to the meeting" as the knowledge extracted from the message. But, what can we say about the sentence "It was now the hour that turns back the desire of those who sail the seas and melts their heart" (from "The Divine Comedy" by Dante Alighieri, the Carlyle-Wikstreed Translation)? Eventually, I can extract from the Dante's verses, more or less, the same information about the daytime, and then decide if I'm late at the meeting. But in Dante's sentence there is much more. I can make many possible connections with my future plans and my past experience. And, as knowing is foremost the act of connecting, I can develop more knowledge from Dante verses than from the sentence "It is eight o'clock". This richness of the message is built in its form, and we cannot mechanically separate the message content from its form. The codification/decodification process is very complex. The cognitive, emotional, and situational context plays a major role both in the codification of raw data and experiences and in the decodification process. On the contrary, ICTs, as any technology, tend to support processes which are context-free. As this goal is impossible to attain, ICT engineers choose another strategy—they define a given context of codification and decodification and derive a list of requisites for the design of effective information and communication formats. It is easy to preview that the research agenda in next years will give more attention to the efficiency and effectiveness of information formats in given organizational contexts. Many theoretical issues are involved in this research area, such as relationships between tacit and explicit knowledge, information and knowledge, and much more.

The sense-making frame. A key point of knowledge management is that a knowledge asset is useful inasmuch that it is continuously redefined by individual and collective learning. If the organization is not able to actively reconstruct its knowledge assets, knowledge disappears. Thus, any organization based on knowledge assets must be a learning organization, able to produce knowledge from knowledge. We know that the learning activity is a linking activity that makes connections between different pieces of information and a sense-making activity that constructs meaning for linked items. ICTs play a major role in supporting the connecting activity, while their role in supporting the sense-making is extremely poor. Probably we need a better understanding of time dimensions involved in developing new knowledge by cognitive actors (individuals and groups). The cognitive actor, while considering new pieces of information, constructs hypotheses, conjectures, inferences, images within three temporal coordinates. The first coordinate is the actual flow of messages coming from context. The second coordinate is that of intentions, desires, goals, plans, and the imagined future being sought. The third coordinate is that of

the past experiences and previous knowledge. These three temporal coordinates define the structure of sense-making. Up to now, the research agenda on ICTs has been mainly focused on spatial dimensions of knowledge management and the efficiency of spatially dispersed knowledge resources and communities. Nevertheless, previous years have found researchers devoting more attention to time issues involved in knowledge management, and to the impact of ICTs on duration and rhythms of individual and group tasks. In the future, it is expected that the research on how IT can support sense-making will receive more attention.

Learning society. The most important claim of researchers and practitioners in the field of KM is that information is widely dispersed in society. Individuals have pieces of information from which others can benefit, but groups often fail to access to the information that the individuals have. In this respect, ICT is expected to produce a dramatic impact in helping people to elicit, transfer and aggregate relevant and dispersed information. The prerequisite is that individuals, groups and institutions are able to create a digital world, where most of knowledge circulating in the human society is encoded in digital artifacts. This digital layer of packaged information is inherently chaotic, as it is built bottom-up without a general design. Moreover, each day new information, new databases, and links modify this world. Thus, it is hard to have stable patterns in this chaotic world. Consequently, patterns could emerge only through the continuous work of knowledge mediators, learning agents of sorts, which patrol the chaotic digital world and construct coherent patterns of links between knowledge committers and knowledge suppliers (Google is an example of such a mediator). A knowledge mediator is one of the players that are necessary to build an effective socio-digital learning society. The task of mediators is to construct a coherent pattern of relationships between knowledge committers and knowledge suppliers. It is easy to forecast that huge research efforts in next years will be dedicated to design and build mediation technologies for the socio-digital learning society. The integration of several mediation technologies, such as wikis, blogs and other collaborative platforms is already bringing about effective exploitation of the collective intelligence of large mass of knowledgeable users. More sophisticated tools, capable to enable easy access to huge bodies of knowledge, are expected to come.

This book, carefully edited by Ettore Bolisani, will provide a wide audience of readers with a general view on research questions and recent advancements on the impact of Internet on knowledge management.

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